

CLAIMS

1. A single-carrier propagated signal comprising:
a preamble segment having a periodic plurality of preamble sequences, each preamble sequence containing 16 b symbols generated in accordance with:

$$5 \quad \frac{1}{32} \sum_{k=0}^{15} b_k b_{k \bmod (k+n, 16)}^* = \begin{cases} 1, n=0 \\ 0, n \neq 0 \end{cases};$$

the 16 b symbols belonging to a 4-quadrature amplitude modulation constellation, a quadrature phase shift keying modulation constellation, or a carrierless amplitude modulation/phase modulation constellation; and

a data segment appended to the preamble,
10 the single-carrier propagated signal being transmittable from a transmitter to a receiver over a communications channel.

2. The propagated signal of Claim 1, wherein the preamble segment has a three preamble sequence of periodic plurality of preamble sequences.

15 3. The propagated signal of Claim 1, wherein the preamble segment has a four preamble sequence of periodic plurality of preamble sequences.

4. The propagated signal of Claim 1, wherein the communications channel is a
20 telephone line.

5. The propagated signal of Claim 1, wherein the communications channel is an alternating current power line.